WHAT IS CLAIMED IS:

1. A method for forming a floating gate in a flash memory device, comprising the steps of:

(a) providing a semiconductor substrate on which a tunnel oxide film and a first polysilicon film are formed;

(b) forming a buffer oxide film and a pad nitride film on the first polysilicon film sequentially;

(c) forming a trench in the semiconductor substrate;

(d) depositing a device isolation oxide film to bury the trench, and then performing a planarization process using the pad nitride film as a barrier;

(e) carrying out a strip process to remove the pad nitride film and at least 50% of the buffer oxide film, at the same time;

(f) removing the buffer oxide film using a pre-treatment cleaning process; and

(g) depositing a second polysilicon film on a whole structure and patterning the second polysilicon film through a patterning process, whereby forming a floating gate including the first polysilicon film and the second polysilicon film.

2. The method of claim 1, wherein the buffer oxide film is deposited with a thickness in the range of 30 Å to 40 Å.

3. The method of claim 1, wherein the buffer oxide film is deposited using high temperature oxide (HTO), tetra ethyl ortho silicate (TEOS), and

DCS-HTO (DiChloroSilane (SiH_2Cl_2)-HTO).

4. The method of claim 1, after the step (c), further comprising a step of performing a wall oxidation process for forming a wall oxide film on an inner surface of the trench and on inside walls of the tunnel oxide film, the first polysilicon film, and the buffer oxide film.

5. The method of claim 4, wherein the wall oxidation process is carried out at a temperature in the range of 800℃ to 1000℃.